

REMARKS

I. Amendments

Independent claims 1 and 17 have been amended to define the metal component having the hydrogenation/dehydrogenation function of the hydrocracking catalyst to include a Group VIII/Group VIB combination of metals. Support for this amendment is found in the published specification at paragraph [0036].

Claims 1 and 17 are also amended to specify that the compounds boiling above 420 °C are not separated from the full range residue product of the distillation step (b) that is fed to the dewaxing step of the claimed process. Support for this amendment is found in the published specification at paragraph [0039].

Dependant claim 6 has been cancelled and claim 7, which depends directly from claim 6, is amended to thereby change its dependency.

II. §103(a) Rejection of claims 1-8 and 12-24 over Gilbert et al (WO 2002/070627) in view of Chen et al (US 4,851,109).

The Gilbert et al Publication

The Gilbert publication teaches a process for preparing a lubricating base oil and a gas oil from a Fischer-Tropsch product. *See* page 1, lines 1-3; claim 1. The Fischer-Tropsch product is relatively heavy with at least 30 wt%, preferably at least 50 wt%, and more preferably at least 55 wt% of its compounds having at least 30 carbon atoms. *See* page 4, lines 7-10. The other fractions indicated by Gilbert that may additionally be processed in the hydrocracking step of its process include “the base oil precursor fraction which cannot be processed in step (c) [i.e., the dewaxing step] and/or off-spec base oil fractions as obtained in step (d) [i.e., the vacuum distillation step].” *See* page 4, line 29 – page 5, line 2. There is no disclosure in Gilbert that the feedstock to its process is or may include a mineral crude derived feed. Instead, the emphasis of the Gilbert disclosure is on the processing of a Fischer-Tropsch product that is relatively heavy and has a significant wax content. *See* page 1, lines 1-3; page, 2, lines 8-17, 30-34; page 4, lines 7-31; page 12, lines 33-34; page 17, lines 6-10; page 19, lines 9-13; and claim 1.

In the Gilbert process, a Fischer-Tropsch product is fed to a hydrocracking/hydroisomerization reaction step that uses a catalyst which comprises an acidic

functionality and a hydrogenation/dehydrogenation functionality. *See* page 5, line 32- page 6, line 31. A particularly preferred hydrocracking/hydroisomerization catalyst comprises platinum supported on a silica-alumina carrier, and the preferred hydrogenation/dehydrogenation functionalities are Group VIII noble metals, for example, palladium and more preferably platinum. *See* page 6, lines 8-10, 14-24. There is no explicit mention by Gilbert of the use of a catalyst comprising a non-noble Group VIII metal and a Group VIB metal combination as a hydrocracking catalyst.

The product of the hydrocracking/hydroisomerization reaction step is separated into a gas oil fraction and a base oil precursor, *see* page 7, lines 20-23, which is subjected to a pour point reduction step of either solvent dewaxing or catalytic dewaxing. *See* page 7, line 30 – page 8, line 32. The catalytic dewaxing step utilizes a suitable dewaxing catalyst that comprises a molecular sieve, a Group VIII metal, a low acidity refractory oxide binder material. *See* page 9, line 27 – page 10, line 26. The molecular sieve may suitably be an intermediate pore size zeolite. *See* page 9, lines 6-17. A binder may be used in the dewaxing catalyst. *See* page 9, line 27 – page 10, line 3. It is preferred for the binder to be a low acidity refractory oxide binder that is essentially free of alumina. *See* page 10, lines 3-5. The preferred class of dewaxing catalysts uses a dealuminated extrudate of the binder and zeolite. *See* page 10, lines 10-26.

Lower boiling, non-base oil fractions are first removed from the catalytic dewaxing step effluent and then separated in two or more base oil grades. *See* page 12, lines 13-31.

The Chen Patent

One of the processes taught by Chen includes a hydrocracker step from which the product is separated into dry gas, lighter products, naphtha and a fraction not converted to naphtha. *See* column 17, lines 1-19. The fraction not converted to naphtha is fed to a second stage unit whereby a portion or all of the fraction not converted to naphtha is processed over zeolite beta isomerization catalyst to produce a premium quality jet fuel blend. *See* column 17, lines 8-19.

In another of the Chen processes for making distillate and lube oil a moderate severity hydrocracking step is integrated with a second stage paraffin selective isomerization/hydrocracking step. *See* column 17, lines 30-36. The first stage hydrocracking catalyst is a large pore size solid with acidic functionality coupled with a hydrogenation function. *See* column 8, line 54-column 9, line 47. The second stage is a hydrocracking or

hydroisomerization step that uses a catalyst combining acidic functionality based on zeolite beta and hydrogenation functionality. *See* column 14, lines 34-68.

Remarks

There are numerous patentably significant differences between the Applicants' claimed inventive process and the processes taught by the Examiner's cited references. It is significant that the Applicants' claimed process is directed to the processing of a particularly defined feedstock through the use of specifically defined catalyst and the distillation of the intermediate streams to provide specifically defined distillation cut points.

In the Gilbert process, a Fischer-Tropsch derived feedstock is processed to yield two or more grades of base oil products. But, on the other hand, the Applicants' claimed invention is processing a mineral crude derived feedstock with more than 10 wt% of the feedstock boiling above 470 °C. Despite the assertions of the Examiner, the mineral crude derived feedstock is a significantly different type of feed with different properties than one resulting from a Fischer-Tropsch process. A Fischer-Tropsch product results from the catalytic reaction of a synthesis gas, comprising a mixture of carbon monoxide and hydrogen, to form alkane compounds. A Fischer-Tropsch product is not even remotely similar to a heavy cut of a mineral crude.

The Applicants' inventive process is further defined to include the use in its hydrocracking step of a particularly defined hydrocracking catalyst that, in addition to comprising an acidic large pore size zeolite, the hydrogenation/dehydrogenation metal of the hydrocracking catalyst is specified to be a Group VIII/Group VIB metal combination. This combination may include, for example, nickel-molybdenum and nickel-tungsten combinations. *See* published specification at paragraph [0036]. These combinations of metals are not disclosed by Gilbert, which teaches that the preferred hydrogenation/dehydrogenation functionalities are Group VIII noble metals of palladium and platinum.

It is additionally noted that the distillation cut points of the intermediate streams of the Applicants' claimed process are not disclosed by Gilbert. As the Applicants noted in their specification, one of the advantageous features of the inventive process is that the full range residue from the first distillation step does not need to be subjected to a distillation step to separate the compounds boiling above 420 °C. *See* published specification at paragraph [0039].

The Examiner states that the Gilbert publication fails to disclose all the features of the dewaxing catalyst recited in the Applicants' claimed process, but he merely dismisses the

differences as being insignificant. The Examiner states that “[o]bviously” the relative amounts of the components of the dewaxing catalyst are result-effective variables in the preparation of a catalyst formulation. But, this is just a mere conclusion that is not supported by any citation of prior art. None of the prior art relied upon by the Examiner suggests that the relative amounts of the components of the Applicants’ claimed dewaxing catalyst are required in the processing of the particularly defined mineral crude derived feedstock that is distilled to the particularly defined cut points. It is not permitted for the Examiner to rely on conclusions that are not supported by cited prior art.

The Examiner makes another unsupported conclusion concerning the claimed boiling range of a gas oil fraction that is yielded from the recited second distillation step of the Applicants’ claimed process by asserting that the gas oil fraction in the Gilbert reference will inherently have a similar boiling range. But, again, this is a mere conclusion, and, in fact, one would expect the products to be different due to the sources being significantly different with the Gilbert source being a Fischer-Tropsch product and the Applicants’ source being a mineral crude derived feed. This is another conclusion that is unsupported by the citation of any prior art.

The Examiner makes still another unsupported conclusion by stating that “[o]bviously” feed stocks from a petroleum origin and a Fischer-Tropsch synthesis are equivalent, but the Examiner cites no prior art to support this proposition. While the Examiner mentions two patents apparently to support his proposition, it is not clear, however, on how he is combining them with the primary and secondary references recited in his rejection. And, in any event, the two patents do not support the Examiner’s proposition. If the Examiner is relying on the references to support his rejection, then they ought to be included in the rejection.

The Examiner makes still further unsupported conclusions by arguing that it is obvious to modify the Gilbert teachings so that its process uses the mineral crude derived feed disclosed in the Chen patent. The Examiner presents the unsupported conclusion that both sources of feed would be expected to produce multiple grades of base oil products. Both of these conclusions are unsupported by the prior art. Since the Gilbert process is directed to the processing of a Fischer-Tropsch product it is impossible to modify Gilbert so as to replace its Fischer-Tropsch feedstock with something completely different. If this were to be done, then the Gilbert process would no longer be the same process. Also, contrary to the Examiner’s statements, with the processing of different feedstocks, one would expect to produce or yield different products.

In another unsupported conclusion presented by the Examiner, he states that it would have been obvious to the substitute silica-alumina of a catalyst with a large pore zeolite; because, as argued by the Examiner, they “are expected to be functionally similar.” It is not clear what the Examiner means by arguing the two components are functionally similar, but, in any event, it is unlikely that the two components would behave or act in the same way when used in a catalyst formulation. The Examiner’s proposition has no support in the prior art.

Concerning the Examiner’s comments regarding claim 2 (item 5), the Examiner argues that Gilbert discloses a process feed having an initial boiling point above 340 °C; however, the text of the Gilbert publication that is pointed to by the Examiner is actually talking about a recycle stream and not a fresh feed.

Concerning the Examiner’s comments regarding claims 3 and 4 (items 6 and 7), it noted that the internal recycle streams of the Applicants’ inventive process are significantly different from any of the internal recycle streams of the Gilbert process for a wide variety of reasons. For instance, the feedstocks are substantially different. Also, the catalyst compositions are substantially different. And, the distillation cut points are substantially different. There are so many differences between the two processes that the recycle streams of the Gilbert process are not comparable to those of the Applicants’ process.

Concerning the Examiner’s comments regarding claim 5 (item 8), such comments are merely an assertion that it would have been obvious to modify the Gilbert reference to include the addition of an isomerized paraffin fraction to its dewaxing unit feed. This presumption, however, is not supported by the citation of any prior art. The Examiner fails to present any teachings of a prior art reference that may be combined with those of the Gilbert reference in such a way as to modify Gilbert to include the limitations of dependent claim 5.

Concerning the Examiner’s comments regarding claim 12 (item 12), wherein it is stated that the Gilbert patent discloses a dewaxing catalyst having a zeolite content of 30 wt%. The catalyst in the Gilbert patent, however, is not similar to the Applicants’ claimed catalyst. The one presented in Gilbert is “a dealuminated silica bound ZSM-5 catalyst comprising 0.7% by weight Pt and 30 wt% ZSM-5.” This is a completely different dewaxing catalyst than the one recited in the Applicants’ claims, which contains a zeolite of the MTW type.

Concerning the Examiner’s comments regarding claims 14 and 15 (item 14) that, because Gilbert uses similar zeolites to those used by the Applicant it is expected that the limitations of claims 14 and 15 of crystal size and alpha value would also be present in the Gilbert catalyst, the

Examiner presents absolutely no prior art reference to support such a conclusion. In fact, the Examiner's conclusion is not correct. The crystal sizes of different zeolite materials may be different even if the zeolites of comparative materials themselves are the same.

Concerning the Examiner's comments in regard to claims 17-24, the comments made above with respect to claims 1-16 also apply with respect to claims 17-24.

III. Provisional Obviousness-Type Double Patenting Rejection of claims 1-8 and 12-24 over Copending Application No. 10/591,115.

Upon the determination of allowable subject matter in the application, the applicants will consider the possibility of filing a terminal disclaimer in order to obviate this provisional rejection. At this time, the applicant does not know what the scope of any allowed claims will be, so is unable to determine the appropriateness of the double patenting rejection.

IV. Conclusion

In view of the remarks above, it is respectfully submitted that the claims 1-5, 7-8, and 12-24 now pending are allowable. Early allowance of these claims is therefore respectfully requested.

Respectfully submitted,

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